Building your own BDI platform

Consider the "room cleaner" example

example beliefs...

```
(isa obj-5 rubbish)
(in  obj-5 kitchen)
(at  obj-5 17 10)
(in  self  hall)
(at  self   3  4)
```

goals...

```
(status kitchen clean)
```

typical messages...

```
(inform goal (status lounge clean))

(inform belief (isa obj-7 rubbish))
```

rules...

```
goal (status ?room clean)
(:not (isa ?x rubbish) (in ?x ?room)) => (post-state (status ?room clean))

goal (status ?room clean)
(isa ?x rubbish) (in ?x ?room) => (post-goal (in ?x bin))

goal (in ?obj ?place)
(holds self ?obj) => (act (goto ?place) (drop ?obj))

goal (in ?obj ?place)
(:not (holds self ?obj)) => (post-goal (holds self ?obj))
```

OR...

(achieve (holds self ?obj))

where…
    (achieve ?f) :=
    (:not ?f) => (post-goal ?f)

operators...

```
(pickup ?x)
pre  (in  ?obj ?room)
     (at  ?obj ?x ?y)
     (in  self ?room)
     (at  self ?x ?y)
     (:not (holds self ?anything))

add  (holds self ?obj)

del  (in  ?obj ?room)
     (at  ?obj ?x ?y)
```

interfacing with the world for (pickup ?x)

```
[ask ?x [ setxy  off-screen-x  off-screen-y
          hide ?x
        ]
[ask self [ set color carry-color ]]
```

writing a deliberation cycle

most of the above can be developed using declarative approaches based on…

- tuple matching
- rule application
- operator application

The deliberation cycle is different in style (ie: procedural) since there is typically a prioritised order, eg:

1. check environment
   eg: has environmental changes addressed / altered current goals
2. check incoming messages
   to update beliefs or modify goals (or even to supply new capabilities, rules, etc)
3. continue processing current goal / goal-stack

…etc

is the goal-stack "a stack"?

should we allow it to become prioritised?

connecting through to an infrastructure layer

typically necessary for…

- incoming messages
- outgoing messages
- interaction with the world
- creation, initialisation & destruction of agents

boid

- add obligation-based deliberation
- greater propensity for O over I is more obligated behaviour
- obligations can link to individuals (leading to reciprocal obligations?)

declaratively (rule?) encoded normative behaviour

ie: it is no longer hard-coded

- where to draw the line (between hard-coded, reason-able norms)
- when to break norms
- what extent to break norms (is it binary or graduated – think violation of speed limits)